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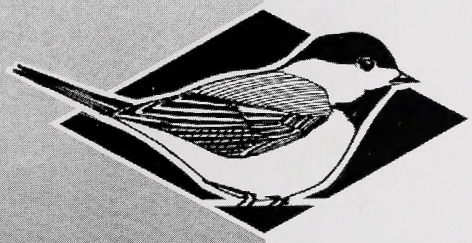

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2002 Burrowing Owl Trend Block Survey and Monitoring, Brooks Area

Alberta Species at Risk Report No. 58

Alberta
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2002 Burrowing Owl Trend Block Survey and Monitoring, Brooks Area

R.F. Russell

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ABSTRACT

Surveys were conducted in the Brooks area (K-blocks) during June 18-27, 2002. Five (5) burrowing owl nest sites and 2 single owls were found in the K-blocks. Productivity monitoring was undertaken in the K-blocks during July 16–21, resulting in 2.80 young per successful nest (n=5). Although there is some reference to the Hanna Blocks in this report, they were not surveyed in 2002.

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A special note of appreciation is extended to the Eastern Irrigation District for allowing the continuation of these surveys.

DISCLAIMER

The opinions and recommendations expressed are those of the author, and not necessarily those of Alberta Sustainable Resource Development.

1.0 INTRODUCTION

The burrowing owl (*Athene cunicularia)* is a small bird of prey about the size of a Richardson's ground squirrel (*Spermophilus richarsonii).* Burrowing owls are unique in that they use the abandoned burrows of ground squirrels (*Spermophilus* spp.), badgers (*Taxidea taxus)* and prairie dogs (*Cynomys* spp.) for nesting, roosting and caching food. The species is found in well-drained grasslands, prairies, steppes, deserts, and agricultural areas in the Americas from Canada to Argentina and Chile (Haug et al 1993). In Canada, burrowing owls were formerly found widely, but often sparsely, distributed across grassland regions of the prairie provinces, and in the interior of British Columbia (Wedgwood 1978); they are now only found in Alberta and Saskatchewan. These populations are migratory, with the birds arriving in mid-April or early May and beginning to nest shortly afterwards. They migrate southward to wintering areas in the southern United States or Mexico (James 1992, G. Holroyd, pers. comm.) in late September and early October.

Burrowing owl populations declined dramatically over much of western North America over the last half of the 20th century. Wellicome (1997) discusses direct and indirect limiting factors attributed to human activities. These limiting factors (in no order of ranking) are habitat loss and degradation, mortality on migration or wintering grounds, pesticides, predation, collision with vehicles and shooting.

In North America, the burrowing owl is ranked 'G4' with widespread distribution: relatively common in appropriate habitat in some areas, but habitat alteration and other factors are causing population declines in many areas (Nature Serve 2001). In most northern Great Plains states, it is considered a 'species of special concern' (Haug et al 1993, Martell 1991, Marti and Marks 1989). In Canada, the burrowing owls is listed as 'endangered' (a species facing imminent extirpation or extinction) by the Committee on the Status of Endangered Wildlife in Canada (2001); it is designated as 'threatened' in Alberta (Alberta Sustainable Resource Development 2001).

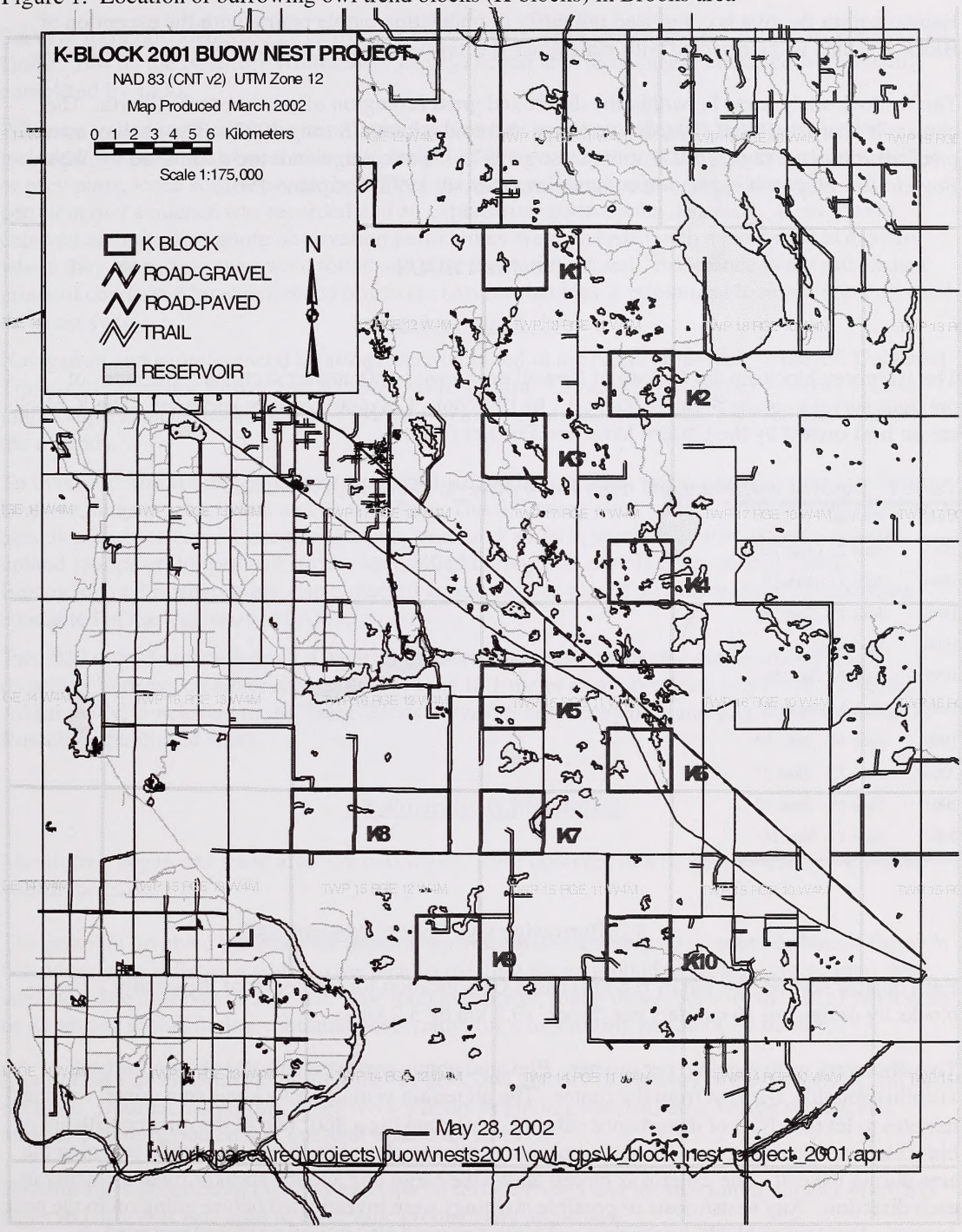
Trend block surveys in Alberta began in 1991 near Hanna (H-blocks), and in 1993 near Brooks (K-blocks). The K-block surveys focused on locating burrowing owl sites within 160 permanent quarter section plots, following a standardized survey protocol. The ten K-blocks were selected at random. Other species of national and/or provincial concern were recorded as incidental observations. Monitoring of these permanent trend blocks allows researchers to compare population trends using a standardized survey protocol (Shyry 1999). Shyry (1999) provided a detailed description with rationale and summary for five years of these surveys; many of the figures and tables presented in this report were derived from Shyry (1999) and updated, as required.

2.0 STUDY AREA

2.1 Kininvie

This study area is referred to as the K-blocks (the terms Brooks and Kininvie are used interchangeably) and is comprised of 160-quarter sections in 10 regularly shaped blocks located in the County of Newell, Alberta (Figure 1). The K-blocks are situated approximately 35 km south and east of Brooks, bounded by Highway 544 to the north and, to the south, by Highway 524.

Figure 1. Location of burrowing owl trend blocks (K-blocks) in Brooks area



Habitat within the area is comprised primarily of undulating native prairie with the exception of Block 4, which is interspersed with tame grass (i.e. crested wheat grass (*Agropyron cristatum*)).

The K-block study areas lie within the dry mixed grass ecoregion of southeastern Alberta. The climate is characterised by hot, dry summers and cold winters (Strong 1992). The median annual precipitation in the region is 272 mm (Strong 1992). Native rangelands are dominated by *Stipa-Bouteloua-Agropyron* vegetation communities (Strong 1992, Coupland 1961).

3.0 METHODS

3.1 Kininvie Area

The 10 survey blocks in the County of Newell encompass 160 quarter sections. The dates of previous surveys can be found in Table 1. In 1993 only 128 quarters were surveyed. The K-blocks are on land owned by the Eastern Irrigation District (EID).

Table 1. Dates of burrowing owl trend block surveys, K-blocks, 1993-2002.

Year	Brooks
1993	June 21 - July 20
1994	June 21 - June28
1995	June 19 - July 28
1996	No Survey
1997	June 7 - June 27
1998	June 17 - June25
1999	June 14 – June 19
2000	June 12 – June 21
2001	June 18 – June 22
2002	June 17- June 24

3.2 Burrowing Owl Survey Protocol 2002

Each quarter section (0.8 km by 0.8 km) had a GPS location for the center of the quarter. The K-blocks by design are 16 quarters per 'block' (3.2 km by 3.2 km).

Two observers were required per quarter. Elevated points were strategically chosen for best visibility roughly 1-200 m from the center. The all terrain vehicle (ATV) was shut down, waiting 5 minutes to let the effect of disturbance subside, while making a 360° pan of the quarter with aid of binoculars or spotting scope. The taped primary call was played for 5 minutes while scanning the area during the call. The caller was placed above the cargo box and the speaker rotated equally in each direction. Any nests/roosts or possible sightings were investigated before going on to the next quarter. Any 'out of block' burrowing owl sightings were also investigated and recorded.

Surveys were not conducted on rainy days or days with wind speeds greater than approximately 20 km/hr., B-4 on the Beaufort Windscale. Surveys began at approximately 0600 and were usually completed by 1430.

When no young were seen, the minimum requirement for determining if a burrow was a nest included: the presence of nest material (dung) in the burrow entrance, the presence of prey, pellets or prey parts, loose soil across the breadth of the burrow floor, feathers and whitewash. All pertinent owl evidence was recorded and an explanation given on the datasheet. If owls were detected after the 10-minute observation period, they were recorded with a clear note to explain where they were, how they were found and why they were missed. Adherence to the established protocol conducted by experienced observers ensures that bias is minimized between observers and different years.

Navigation and georeferenced locations were recorded in the North American Datum 83 Universal Transverse Mercator format and achieved with Garmin™ 12 and 12XL Global Position System units. A permanent marker pin was placed 1 m away from the head of the burrow (area opposite the mound).

To maximize the amount of information obtained, additional data was recorded on plots including land use, human occupation, and % visibility. The following other species were also recorded on a presence/absence basis: ferruginous hawk, swainson's hawk, short-eared owl, Baird's sparrow, upland sandpiper, loggerhead shrike, long-billed curlew and any other uncommon fauna. Burrowing owl feathers were also collected at nest sites as part of a stable isotope project being conducted at the University of Alberta.

Two 800 m Richardson's ground squirrel transects were also conducted per block, including recording burrows on either side of the ATV up to 1 meter away, resulting in 3200m^2 surveyed. Additionally, concurrent to the Trend Block survey, a nest occupancy analysis was conducted (R. Russell, unpublished data).

3.3 Productivity Monitoring

Monitoring began one week after the first owlets were observed at a number of control nest sites within the EID.

The protocol involved the observer positioning himself at a distance so as not to influence the owls' behaviour or at a distance equal to the nearest existing above ground disturbance (e.g., road, well site, etc.) The observer then counted the total number of young observed, with the aid of binoculars or a spotting scope, during continual observation for a monitoring period of 30 minutes.

Monitoring was undertaken during times of peak owl activity that occurs in early morning and early evening. Optimal monitoring times were 3 hours beginning one-half hour before sunrise and another 3-hour period ending one-half hour after sunset.

Monitoring was conducted with three visits on different days and the maximum number of owlets observed at a visit was used to determine productivity at the nest.

4.0 RESULTS

The 2002 K-block surveys occurred during June 17-24 (See Table 1). All 160-quarter sections were completed in the K-blocks.

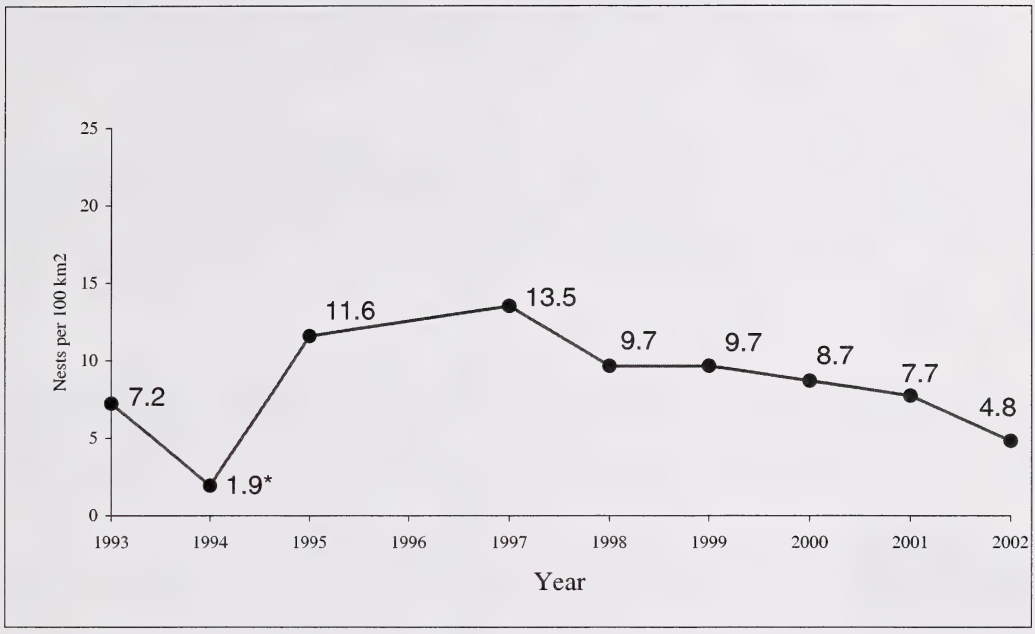
The 11 sites found during the survey are detailed in Table 2. This table includes two sites that were determined to not be nests ("not marked" site and "roost" site), as well as two nests that were missed during the K-block survey itself, but located during the companion survey (R.Russell, unpubl. data). Additionally, one "off block" site was found outside of the K-block study area and is included in Table 2. The numbers of burrowing owl nests per 100 km^2 are detailed in Figure 2.

Table 3 details the results of the productivity monitoring undertaken July 16-21. Table 4 provides a summary of successful nests found in the Brooks area from 1993-2002. The average number of juvenile owls that were observed per successful nest site is presented in Table 5 and Figure 3.

Table 2. Results of 2002 burrowing owl K-block trend survey.

BURROWING OWL K-BLOCK RESULTS 2002				
WPT	DATE	K-BLOCK	TOTAL # OF OWLS	BURROW NUMBER
BO200201	17-Jun	1	2	614-27389
BO200202	17-Jun	2	1	816-16531
BO200203	17-Jun	2	1	614-27395
BO200204	17-Jun	2	2	Not Marked
BO200205	18-Jun	3	1	Roost
BO200206	24-Jun	3	2	745-02514
BO200207	24-Jun	3	2	745-02512
BO200208	24-Jun	3	1	BWC 073
MISSED IN SURVEY				
BO200103	25-Jun	6	1	BWC 064
BO200209	18-Jun	2	1	BWC 022
OFF BLOCK				
1	24-Jun	6	1	Off Block
TOTAL OWLS OBSERVED			15	
TOTAL OWLS IN BLOCK			12	
TOTAL OWLS OFF BLOCK			1	
TOTAL LOCATIONS			11	
LOCATIONS INSIDE K-BLOCKS			8	
LOCATIONS OUTSIDE BLOCK			1	
LOCATIONS MISSED IN SURVEY			2	
0	YOY OBSERVED DURING K-BLOCK SURVEY			
14	YOY OBSERVED IN PRODUCTIVITY SEARCHES			
5	2002 BURROWS WERE MARKED			

Figure 2. Number of burrowing owl nests per 100 km^2, K-block surveys, 1993-2002.



* Not complete survey (less area surveyed)

Figure 3. The average density of nests in the Brooks study area over time (polynomial regression).

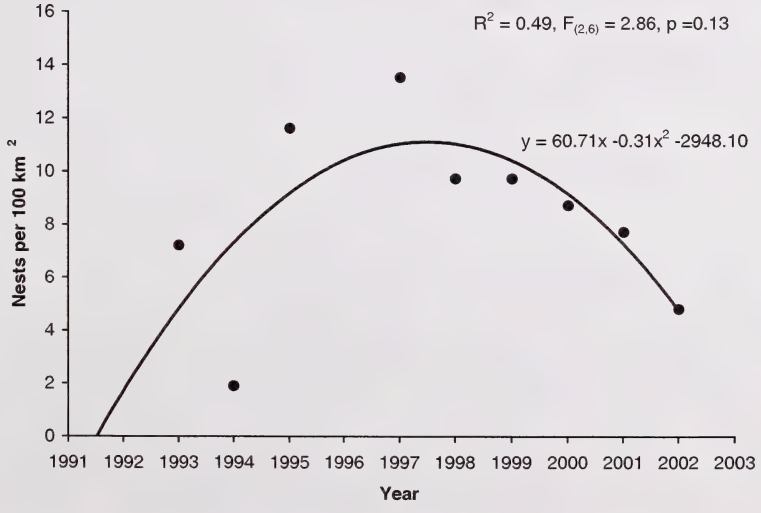


Table 3. Results of 2002 burrowing owl K-block productivity monitoring.

BURROWING OWL K-BLOCK PRODUCTIVITY 2002

WPT	DATE	K-BLK	INITIAL	BURROW	PRODUCTIVITY SEARCH					
			# OWLS	NUMBER	VISITS			MAXIMUM		STATUS
					DATES	Adults	YOY	Adults	YOY	
BO200201	17-Jun	1	**2**	614-27389	16-Jul	2	0	2	1	Nest
					18-Jul	2	1			
					19-Jul	1	**1**			
BO200202	17-Jun	2	**1**	816-16531	16-Jul	1	0	1	0	Single
BO200108	16-Jul	2	**1**	614-27394	16-Jul	2	2	2	3	Nest
BO200209	*	*	*	BWC 022	18-Jul	2	3			
					19-Jul	1	**3**			
BO200203	17-Jun	2	**1**	614-27395	18-Jul	1	**4**	1	4	Nest
					19-Jul	0	2			
					21-Jul	0	3			
BO200204	17-Jun	2	**2**	-	18-Jul	0	0	2	0	Failed
BO200205	18-Jun	3	**1**	-				1	0	Roost
BO200206	24-Jun	3	**2**	745-02514	18-Jul	2	4	2	4	Nest
					19-Jul	1	3			
					21-Jul	2	**4**			
BO200207	24-Jun	3	**2**	745-02512	16-Jul	0	0	2	0	Failed
BO200208	24-Jun	3	**1**	BWC 073	18-Jul	2	2	2	2	Nest
					19-Jul	2	2			
					21-Jul	2	**2**			
* This nest was "missed in survey" (Table 2)						**Total**		**15**	**14**	
					Average # of juveniles observed/successful nest				**2.80**	
						Total # Nests				5
Note: Bold indicates maximum # of owls observed						Total # Failed				2
						Total #Singles				1
Missed during the survey therefore not included in totals.										
BO200103	25-Jun	6	**1**	BWC 064	18-Jul	1	3	2	5	Nest
					19-Jul	2	**5**			
					21-Jul	1	2			
				The totals if this nest was included:						
						Total		**17**	**19**	
					Average # of juveniles observed/successful nest				3.17	
						Total # Nests				6
						Total # Failed				2
						Total #Singles				1

Table 4. Number of successful burrowing owl nests observed during K-block productivity monitoring, 1993-2002.

Year	1993*	1994	1995	1996	1997	1998	1999	2000	2001	2002
Brooks	6*	2	12	N/S	14	10	10	9	8	5

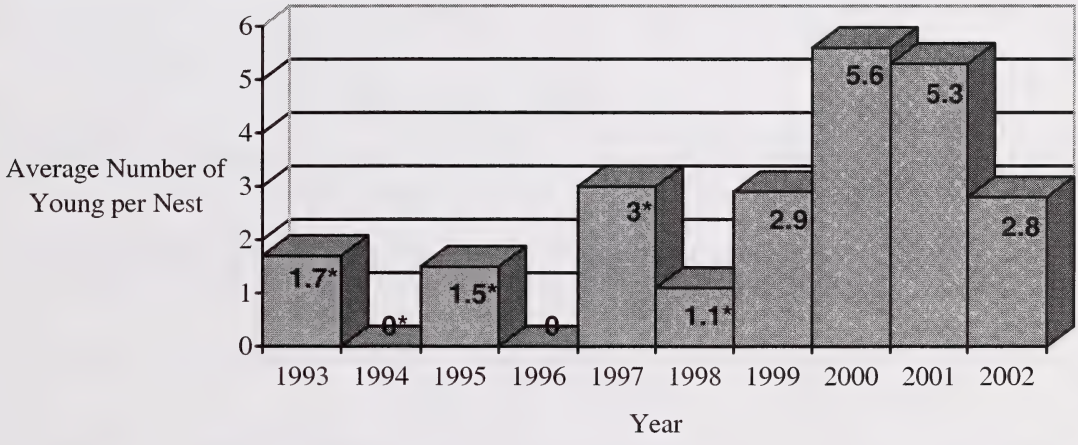
* Not complete survey (less area surveyed); N/S = No survey done

Table 5. Average number of juvenile burrowing owls observed per successful nest-site during K-block productivity monitoring, 1993-2002.

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Brooks	1.7*	0*	1.5*	N/S	3.0*	1.1*	2.9	5.6	5.3	2.8

* No formal productivity surveys performed until 1999. 1993-1998 are incidental observations
N/S = No survey done

Figure 4. Average number of juvenile burrowing owls observed per successful nest-site during K-block productivity monitoring, 1993-2002.



* Incidental Observations

5.0 DISCUSSION

Two crews completed the K-block surveys over an 8-day period. Poor weather caused delays. The number of successful nests located is down from 8 to 5 (-40 %). These reduced numbers may be a result of low prey populations. This was the third year of a drought with below normal snow accumulation, and subsequently a lack of voles and other foods. The number of juvenile owls per successful nest in 2002 was lower than the 2001 results (only 2.8 juveniles in 2002, compared to 5.3 in 2001--a 47% decline). This may also be an indication of the lack of available foods.

Further efforts were made to evaluate the use and status of any previously recorded nest sites in the blocks. Two additional nests were located that were missed in the Trend Survey, which represents a "confidence limit" of 13/15 or 85% (Reg Russell, unpubl. data).

6.0 MANAGEMENT IMPLICATIONS AND FUTURE DIRECTIONS

The need to keep landholders informed on both Federal and Provincial Government initiatives involving species at risk is paramount if managers are to be successful in their efforts. A close working relationship exists between Alberta Sustainable Resource Development and the Eastern Irrigation District in the Brooks area. The continuation of these surveys will only be successful if landholders concerns are alleviated. A previous 3-year agreement for the exchange of information and access for the survey will expire in April 2003. Plans are being made to extend this Memorandum of Understanding.

The trend block surveys provide the only rigorous measure of how burrowing owl numbers are being maintained during the breeding season in Alberta. Further information for the wintering months would enhance the overall picture. A continuation of the survey for 2003 will require additional advance preparation time and additional funding. There is a good possibility the trend surveys for the Hanna area will be re-established for 2003.

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